The Journal of Laboratory and Clinical Medicine

VOL. II. DECEMBER, 1916 No. 3

Editor-in-Chief: VICTOR C. VAUGHAN, M.D.
Ann Arbor, Mich.

ASSOCIATE EDITORS

DENNIS E. JACKSON, M.D. - - ST. LOUIS
HANS ZINSSER, M.D. - - - NEW YORK
PAUL G. WOOLLEY, M.D. - - CINCINNATI
FREDERICK P. GAY, M.D. - - BERKELEY, CAL.
J. J. R. MACLEOD, M.B. - - - CLEVELAND
ROY G. PEARCE, M.D. - - - - CLEVELAND
ROGER S. MORRIS, M.D. - - CINCINNATI
GERALD B. WEBB, M.D. COLORADO SPRINGS

Contents of this Journal Copyright, 1916, by The C. V. Mosby Company—All Rights Reserved

Entered at the Post Office at St. Louis, Mo., as Second-Class Matter

EDITORIALS

The First Year of the Michigan Tuberculosis Survey

IN a former article in this journal (vol. i, p. 134) I told of the plan of the Michigan State Board of Health for carrying out the tuberculosis survey of the state, a work rendered possible by the appropriation of the sum of $100,000 by the legislature of 1915. At the time of my former writing the survey was in its beginning. Now, one year has been given to it, and it may be of interest to give in some detail the plan pursued and the results so far obtained. The purposes had in view were: (1) The finding of, by physical examination, so far as possible, all cases in the state. (2) The instruction of each tubercular individual, so far as found, and of his family in the methods of living best suited to prevent the spread of the disease to others and to arrest the progress of the disease in the individual. (3) The placing of each infected individual under the care of a local physician. (4) The awakening of each community to the desirability of concerted action in the endeavor to restrict the disease.

The area unit of the work has usually been the county, and the time devoted to each county has been three weeks. In some of the more sparsely inhabited sections two counties have been taken as the unit. During the first week two visiting nurses go into the county and, first of all, they visit the local physicians

The Journal of Laboratory and Clinical Medicine

VOL. II. DECEMBER, 1916 No. 3

Editor-in-Chief: VICTOR C. VAUGHAN, M.D.
Ann Arbor, Mich.

ASSOCIATE EDITORS

DENNIS E. JACKSON, M.D. - - ST. LOUIS
HANS ZINSSER, M.D. - - - NEW YORK
PAUL G. WOOLLEY, M.D. - - CINCINNATI
FREDERICK P. GAY, M.D. - - BERKELEY, CAL.
J. J. R. MACLEOD, M.B. - - - CLEVELAND
ROY G. PEARCE, M.D. - - - - CLEVELAND
ROGER S. MORRIS, M.D. - - CINCINNATI
GERALD B. WEBB, M.D. COLORADO SPRINGS

Contents of this Journal Copyright, 1916, by The C. V. Mosby Company—All Rights Reserved

Entered at the Post Office at St. Louis, Mo., as Second-Class Matter

EDITORIALS

The First Year of the Michigan Tuberculosis Survey

IN a former article in this journal (vol. i, p. 134) I told of the plan of the Michigan State Board of Health for carrying out the tuberculosis survey of the state, a work rendered possible by the appropriation of the sum of $100,000 by the legislature of 1915. At the time of my former writing the survey was in its beginning. Now, one year has been given to it, and it may be of interest to give in some detail the plan pursued and the results so far obtained. The purposes had in view were: (1) The finding of, by physical examination, so far as possible, all cases in the state. (2) The instruction of each tubercular individual, so far as found, and of his family in the methods of living best suited to prevent the spread of the disease to others and to arrest the progress of the disease in the individual. (3) The placing of each infected individual under the care of a local physician. (4) The awakening of each community to the desirability of concerted action in the endeavor to restrict the disease.

The area unit of the work has usually been the county, and the time devoted to each county has been three weeks. In some of the more sparsely inhabited sections two counties have been taken as the unit. During the first week two visiting nurses go into the county and, first of all, they visit the local physicians

and secure their cooperation. This has been most successful and no physicians have failed in giving the work most hearty support and personal aid. The nurses then go to the teachers and ask them to advise all scholars who seem under par in health to come to the clinics. Along with the nurses, the publicity agent goes. He secures the cooperation of the local newspapers which print articles furnished by the agent, and advertise the free clinic and advise all to go to the clinic. Thousands of columns of information concerning tuberculosis have been published by the newspapers of the state without cost. Ministers are asked to preach about tuberculosis on the Sunday at the close of the first week. Manufacturers are asked to advise all men working under them, and who are in any way out of health, to go to the clinic.

The second week is the clinic week. The diagnosticians are selected for their special skill in the detection of the disease in its early stages. They are men who have the respect and confidence of the profession. Clinics are held simultaneously in each important city or village in the county. In each place three rooms are used, a waiting room, a dressing room, and a clinic room. In the first are trained nurses taking the histories and the temperatures, and making a triplicate record. These records accompany the patient into the clinic room where the expert makes his examinations in the presence of the local physicians. Indeed, he gives a clinic on the diagnosis of tuberculosis. It is estimated that more than ninety-five per cent of the local physicians attend these clinics and some have become so deeply interested in the work that they have followed the expert from county to county, and have become so skilled themselves that they have been added to the staff. The clinician continues the records begun by the nurses, and turns over one copy to the family physician of the individual, who is expected to report the further history of the case.

The third week is given to educational work and this is devoted to both the community and to the individual. Every positive case found by the expert is visited in his home by a trained nurse who gives practical lessons in house sanitation, food, sleeping quarters, etc. Talks are given in the schools, factories, churches, clubs, etc. The county legislators, or supervisors, as they are called in this state, are seen and the county's needs and duties are pointed out. The local physicians are urged to provide weekly free clinics for the detection of tuberculosis. The need of a county sanatorium for the cure and education of the positive cases is made evident. In all these directions, the work is bearing excellent fruit. As a result of this work, seven full-time health officers have already been provided in small cities and several counties have made appropriations for sanatoria.

I am quite convinced that the training of the physicians of the state in the early diagnosis of tuberculosis will ultimately prove of the greatest value. The people in general will soon forget about the campaign against tuberculosis, but the local physicians will not forget and with their weekly free clinics they will keep the work going, will prove its value to the community, and will secure for themselves a higher appreciation of the nature and value of their services.

As concrete examples of what is being accomplished, I may mention St. Clair and Ingham Counties, of which Port Huron and Lansing are the county seats. In the former county 464 persons were examined and 86 found to be

positive and 82 suspicious. These findings have led already to provision for an open air school for the tuberculous children, a full-time and permanent visiting nurse, and a vote to appropriate $15,000 for a county sanitorium. In Ingham County 524 persons were examined with 116 positive, and 97 suspicious. As a result, the county has a sanatorium, and the city, a full-time health officer.

Among the school children examined, 1114 have been found to have the disease. However, a larger number has been found in the productive age—from twenty to fifty years.

The total population of the area surveyed in the first year is 1,319,283. The number examined is 11,528; positive, 2,914; suspicious, 2,231; arrested, 375. There is no claim that all cases of tuberculosis in the area covered were found. The physicians in their weekly clinics are constantly adding to the number. It would not be fair to suppose that if all the inhabitants of the area were examined the percentage of positive cases would be nearly so high as that found among those actually examined, because these were selected for examination either because they were known to have been unusually exposed to this infection or because of the evident fact that they were not in robust health. Of the positive cases found only two per cent had already been reported. In other words, ninety-eight per cent were cases which had not been recognized until this examination. The positive cases are distributed by stages of the disease as follows:

Advanced	6.8 per cent
Moderately advanced	27.2 per cent
Incipient	52.6 per cent
Arrested	12.9 per cent
Not determined	0.5 per cent

The medical history of this year's work is now being prepared and will undoubtedly make a valuable contribution to the literature of tuberculosis. It is the hope of the State Board of Health that it be permitted to go over the state again in a similar way and finally so organize each county that it may efficiently continue the work until the disease is wholly eradicated.

—*V. C. V.*

The Choice of Ruling in a Blood Counting Chamber

THE introduction of the blood counting apparatus with the well-known ruling of Thoma has been of inestimable value to clinical medicine. So indispensable is it that the physician of the present day cannot practice modern medicine without a satisfactory hemocytometer as part of his equipment.

The original Thoma ruling of the counting chamber is designed for enumerating the erythrocytes alone. It is not, however, a satisfactory ruling for counting the leucocytes. To secure a ruled surface in a counting chamber adapted to enumeration of *both* red and white cells, the original Thoma ruling has been modified; among the best known modifications are the Neubauer and Türk rulings. Of the various rulings described, that of Neubauer is superior to all others, in

the opinion of the writer. The ruling for counting the leucocytes is simple and employs the fewest possible lines for an accurate count.

So obvious is the advantage of the Neubauer or Türk ruling over the original ruling of Thoma, that it is unfortunate that the latter is still upon the market. In protesting to one of the well known dealers in this country against the sale of counting chambers with the Thoma ruling, the writer was surprised to learn that *more than one-half of all orders received, specified the Thoma ruling.* This is doubtless due to ignorance on the part of the purchaser, for the cost of a counting chamber with one of the newer rulings is very little more.

To do away with the sale of counting chambers with the original Thoma ruling, it is to be hoped that authors of works on clinical pathology will eliminate from future editions illustrations of the Thoma ruling, showing only those of Neubauer, Türk, Zappert-Ewing, etc. It would also be a great gain, if the counting chamber manufacturers and dealers would agree to discontinue cuts and descriptions of the original Thoma ruling in their circulars.

The counting chamber designed by Bürker in 1907 is rapidly growing in popularity. It provides two ruled areas, and preparations for counting both red and white cells can be made at the same time, thus shortening the operation considerably. Filling the chamber is also much simpler in the Bürker hemocytometer. A disadvantage of Bürker's chamber, the writer believes, is the ruling. Several years ago, at the request of the writer, Zeiss made the Bürker chamber with the Neubauer ruling; and very recently an American firm, Max Levy, has also placed the Bürker chamber with Neubauer ruling on the market, as well as a modified chamber with various rulings.

Those purchasing counting chambers are urged to investigate the advantages of the different rulings before ordering apparatus. Authors and dealers might render a service by emphasizing the fact that the *Thoma ruling is suitable for counting red blood cells only.*

—*R. S. M.*

Vitalism and the New Physiology

IN the ever expanding volume of biological literature there occasionally appear articles in which an account is given of the present-day attitude of different schools of thought regarding the time-honored question as to the essential nature of the life processes. The well-known address of Sir Albert Schäfer before the British Association in 1912, that of Sir Oliver Lodge two years later before the same society, and still later, in 1916, that of Professor A. B. Macallum[1] before the Society of Biological Chemistry of this country, have served during recent years as bulletins of the progress that is being made. If we were to take these three papers as the sole evidence upon which to form an opinion, we should be compelled to conclude that a mechanistic conception of the life processes is more tenable than one which holds that some specific

[1]Presidential address, Jour. Biol. Chem., 1914, xvii.

influence, called for want of a better term "vital force," is the important controlling factor. But again we must reopen the controversy, for in his recent Harvey lecture entitled "The New Physiology," Dr. J. S. Haldane of Oxford,[2] England, has presented a mass of evidence which is so strong in favor of a view which, although not vitalistic in the older, narrower sense, is so definitely opposed to that of pure mechanistic physiology that it cannot be disregarded.

It is pointed out at the start of this lecture that it was about the middle of last century that a group of physiologists, impressed with the wonderful advances then being made in physics and chemistry, broke away from the "vitalism" of their fathers and essayed to demonstrate, by their experiments, that all animal functions are explicable on a purely physico-chemical basis. Although it is undoubtedly the case that great success often attended the researches undertaken from this point of view—it being often possible to find some satisfactory physico-chemical explanation for an isolated physiological process—yet as time has passed, fewer and fewer have been the results of such a nature, until at last we have come to recognize that to obtain them, innumerable conditions in the environment of the responding tissue must be maintained in a so-called "normal state." Now, as Haldane insists, the necessity for the existence of this normal state, in order that a given stimulus may always have the same effect, indicates that there is something involved in the life processes that is not present in the physical world. "The physiologists who led the revolt of last century against vitalism" did not see the network of conditions which come into play in influencing the effect which a given stimulus will have, and moreover these older workers started out from a false physico-chemical viewpoint in that they imagined the then recently discovered fundamental laws of chemistry (the atomic theory, etc.) to represent the bed-rock of physico-chemical knowledge.

The maintenance of this normal state is the one characteristic of living things, and the aim of the new physiology should be "not to ascertain the causes of vital activity but to trace out its normal details." To make this clear, various examples are given of recent researches, particularly of those in which the author has himself taken so prominent a part. Thus, in the response of the respiratory center to the slightest changes in the CO_2-tension of the blood is seen a mechanism of the finest order of delicacy for maintaining a normal reaction, that is, a normal H-ion concentration, in the blood. Whenever anything occurs which tends to upset this normal condition, causes, such as stimulation of the vagi, come to have effects which are entirely different from those ordinarily observed: e.g., apnea cannot be produced by ordinary inflation or deflation of the lung when there is a high tension of CO_2, but it is readily produced when the tension is low.

As another illustration, take the recent observations by Haldane and Priestley on the excretion of water by the kidneys. After drinking very large quantities of water the urine becomes extremely copious and very dilute, thus indicating that the secreting cells of the kidney are stimulated to activity by some change in the concentration of the blood; they form one of the physiological mechanisms involved in maintaining "the normal." The question is, must a

[2]Reprinted in Science, Nov. 3, 1916.

physico-chemically measurable change in blood-concentration occur to bring about this diuresis, or are the cells so reactive to deviations from the normal that they respond to changes in concentration which we cannot detect? To answer these questions, the authors examined the hemoglobin content and the electrical conductivity of the blood, before and during the potations, with the result that no change could be detected in hemoglobin content, and one that was just perceptible in electrical conductivity. Evidently then the renal cells, like those of the respiratory center, are attuned to react with marvelous sensitivity to changes from "the normal" in the blood which are no more than just perceptible by the most delicate and refined of physico-chemical methods of measurement.

These observations along with many others, such as the constancy in the concentration of sugar and sodium chloride, indicate that a very fine physiological regulation of the composition of the blood is provided, which is also the case for the regulation of its total volume and temperature. These are the "normals" and the function of the physiologist should be not to seek for some causal explanation for each separate normal which he may succeed in isolating and studying apart from other normals, but to seek for interconnected normals and "their organization with reference to one another and to other organic normals." This is not vitalism but simply biology, being the same method of study as that followed by the anatomist "who seeks for the normal—the type—which runs through and dominates the variety of detail which he meets with, and who reaches more and more fundamental types." Such an idea of an organized normal, as the determining factor for physiological reaction, brings "unity and light into every corner of physiology, for it helps us to predict just as the ideas of unalterable mass and energy help us to predict." Life then is something apart, it is an entity, and it cannot be defined in terms of anything simpler, "just as we cannot define mass or energy in terms of anything simpler."

The new physiology, therefore, concerns itself with the study of the normals, how they are related to one another, how they react on or are affected by other normals, their relationship to environmental conditions, and so forth. It is not biophysics or biochemistry, but is biological physiology. The attempt to interpret living organisms in terms of physico-chemical laws is judged as having been "the most colossal failure in the whole history of modern science."

The paper concludes with a comment on the relationship between physiology and medicine, which in essence is to the effect that "the mechanistic physiology of the nineteenth century has failed to take the rightful position of physiology in relation to medicine." The reason given for this false attitude is the failure of the mechanist to recognize that in life we have to deal not with simple matters of cause and effect, but with interconnected normals. Disease is a perversion of the normal, so that the physician must know the normal in its elastic and active organization; he must know how health is maintained under the constantly changing conditions of environment. His pathology should concern itself largely with the study of how health tends to reassert itself under abnormal conditions, and his pharmacology should be not so much an investigation of the action of drugs, but how these may be used to aid the body in the maintenance or reestablishment of health. The author claims to be able to see this new physiology as applied to medicine growing up more quickly in this

country than in the old, because we have the advantage of having less of old intellectual machinery to discard.

In advocating that the physiologist in his investigations should proceed, without any bias in favor of a physico-chemical hypothesis, to collect accurate information regarding the working and interdependence of the various functions which go to make up the normal, there is no clear argument that a mechanistic view of life is untenable. That the normal condition of the blood should require for its maintenance a degree of sensitivity on the part of the respiratory center (toward H-ion concentration) or of the kidneys (towards the water content of the blood) that is reactive to changes which we can scarcely recognize by physico-chemical means surely does not warrant us in denying that a mechanistic interpretation for the reaction may exist. So far as any conclusion is justifiable, it would appear to be merely that the reactive tissues are of a delicacy that is greater than the physicist or chemist is at present familiar with. Nevertheless the lecture is of immense value in warning us that we should adopt, for the present at least, a different attitude towards many biophysical and biochemical problems, and, instead of going out of our way to explain them in terms of some mechanistic hypothesis, devote our attention to accurate and thoroughly controlled observation of the facts.

—*J. J. R. M.*

Epilepsy

EPILEPSY has for many years been a puzzle. Doubtless it will remain a puzzle judging from the remark of Foster Kennedy[1] that "from the West we hear of the epilepticoccus and the removal of the intestine, and from the East we are told that epilepsy represents an effort of the individual to resume his fetal position in the mother." If we come no closer to it than the limits set in that statement, no wonder we worry.

Also in view of the appearances of various dogmatic statements concerning the causes of epilepsy in each of which there is a grain of truth—and sometimes two grains—we should be grateful for a discussion, which, like Dercum's,[2] summarizes fairly the situation. Dercum calls attention to the fact that, as has long been known, heredity plays a part in the appearance of epilepsy, and, as he says, if one considers all forms of nervous and mental disease in the ancestry, then the heredity percentages are high. If the inquiry is restricted to the transmission of epilepsy alone, the percentage falls. But even so a family history of nervous and mental diseases is of great significance. Other factors than heredity are alcoholism, syphilis, and other toxic factors among which is lead poisoning, each of which, when it is an ancestral factor, acts through the germ plasm in establishing an unstable individual, and so, Dercum says, "approaching the subject from whatever point of view we choose, the inference is unavoidable that in a large number of epileptics there has been a primary, a basic impairment of the germ plasm. Such an impairment may show itself in various nervous or mental conditions, among which is epilepsy."

[1]Kennedy: Jour. Am. Med. Assn., 1916, lxvii, 252.
[2]Dercum: Ibid., 247.

Aside from these cases there are others in which there can be no reasonable doubt that the disease is directly produced by intoxications and infections. As intoxicants, alcohol and lead are known. As infectious agents many of the bacteria are known to be active. The convulsions which accompany the infectious diseases of childhood are to be regarded merely as epiphenomena of the infectious processes, and are to be explained by a direct toxic action on the cortex. Quite commonly they disappear with the infection. Unfortunately, they occasionally persist as established epilepsies. Epilepsy every now and then follows an attack of typhoid or scarlet fever, less frequently measles, whooping cough or influenza. Not uncommonly there is a history of convulsions accompanying the infection, and then, after an interval, possibly of months or of years, the establishment of epileptic attacks follows. In such cases the cause may be in mild encephalitides or even in scarring and contraction of the meninges caused by the original infection.

Another factor is trauma, which produces mild lesions at the time of injury, which in healing lead to irritation of the cortex.

When, Dercum says, we review the facts, one fact stands forth with striking prominence, namely, that epilepsy is not a specific clinical entity, but is a symptom complex which may be brought about by one of several chance factors. Whether the cause in a given case is internal secretional defects, infection or trauma, one may only discover by close analysis of the case. Treatment will be governed by these discoveries.

—*P. G. W.*

Anatomy from the Clinical Standpoint.

THERE is probably no part of the description of the body so badly in need of revision in our textbooks as that of the pelvis, and this notwithstanding the fact that many attempts have been made during recent years to elucidate further the problems connected with this region. The old descriptive anatomy is rapidly becoming superceded and the body is being viewed as indeed it must be if the physical features in their details are to have any real practical and living value, from the standpoint of function. This by no means belittles the significance of pure morphology. It simply brings anatomy into line with the practical study of medicine from which during the last two decades it has tended somewhat to become divorced.

Dissection, while it reveals the details of structure so necessary for adequate knowledge of the body, is apt by the very technic employed to obscure our view of the body as a functioning structure. We fail to get the correct perspective; to estimate properly the proportionate importance in function of the different elements. As an example we may quote the extraordinary ingenuity involved in framing the description of the pelvic fascia as it is given in all our present day textbooks. So involved is this description and so impossible to comprehend that on the face of it we are inclined to doubt if the description can accurately represent the actual conditions. So misleading has the time honored statement of the pelvic fascia become even to anatomists of standing that we find in the present

edition of Cunningham's "Practical Manual" the curious statement that the bladder prostate, lower part of rectum and ureters are not in the pelvis at all, but in the pelvic wall since they are imbedded in pelvic fascia. Surely when descriptive anatomy has attained such ludicrous extremes it is time to call a halt.

Many writers working on the clinical aspect of anatomy have added greatly to our knowledge of the functional significance of the structures in the pelvis, more especially the importance from a practical standpoint of the connective tissue which is massed together under the general term *pelvic fascia.* So far they have been unable to influence the textbooks, largely because they have confined their remarks to isolated portions of the pelvis and have not dared boldly to overthrow the time honored descriptions.

If we are thoroughly to understand the significance of the pelvic connective tissue, it is not sufficient simply to "depolarize" the terms employed; these have been used for so many generations that it is not possible to eradicate from the minds of readers their ancient significance. It is necessary to describe the pelvis entirely anew, using terms which shall have a fresh significance and which cannot by any possibility be misunderstood. Until this is done ruthlessly and efficiently, anatomists must expect that their clinical colleagues will continue to deplore the unpracticality of the study of conventional anatomy.

Let us consider for a moment the connective tissue surrounding the vessels and nerves which run to the rectum entering the viscus below the great valve of Houston, in other words, through the perineal chamber. Quenu and Hartmann in their description of resection of the rectum stated that after cutting through the levatores ani the surgeon will find the sacro rectal fibrous tracts and certain insignificant nervous and vascular branches which he will tear out or cut through to free the rectum. Naturally it is not here the purpose to discuss the precise method of excision of the organ. We wish merely to emphasize the fact that our brilliant French contemporary was misled by conventional anatomical description. It is true that the connective tissue when dissected is not powerful but is it right to consider this tissue, as many anatomical writers do, in the wholly artificial state of being separated into sheets or strands postmortem? Every surgeon realizes that when he has cut the levatores ani only he can pull down the rectum a matter of two inches at the most and that if he stitches the bowel into the anal skin there will be considerable tension on the sutures. There must be something holding up the rectum and this something is really the "insignificant" strands of connective tissue surrounding the vessels and nerves of supply.

The term rectal stalk has been suggested by Professor Elliot Smith for the perineural and perivascular connective tissue supporting the perineal chamber of the rectum, in the conventional description the lateral part of the lower or rectal layer of the endopelvic or visceral pelvic fascia. The conventional term, however, means nothing and should be discarded; it should be replaced by Waldeyer's term, fascia propria of the rectum, since it is desired to convey the significance that this fascia clinically makes the rectum a "self-contained" organ. Laterally the fascia propria is more extensive, constituting the rectal stalks.

That these rectal stalks are actually of importance in supporting the rectum is obvious from our surgical experience already mentioned in the old operation of perineal resection and if this operation is now largely discredited it has at least taught us the necessity for revising our description of pelvic anatomy. In a series of dissections made upon new born infants and upon adults I found that the isolated but undissected rectal stalk measures only about half the length of the contained nerves and blood vessels.

The nerves and blood vessels therefore are not made use of as supporting bands; one would not expect it; the surrounding connective tissue in bulk mingled with the accompanying muscular strands acts as the real but quite elastic support of the viscus. The comparative length of the nerves and blood vessels allows some possibility of movement of the rectum as a whole, permits prolapse to a limited extent, as seen in infants, but so long as the nerves and blood vessels remain uninjured the connective tissue surrounding them allows only a moderate displacement.

Relatively speaking the rectal stalks in the infant are as long as those in the adult and it is not correct to state that prolapse in the young child is due to laxity of the attachments of the organ. Prolapse is permitted in the infant, as it would be in the adult, but for the fact that in the latter the sacral promontory overhangs and protects the rectum from direct pressure. Moreover in the adult the genital and vesical organs are not, as they are in the infant, in a position to exert pressure on the rectum.

We are not therefore to imagine that the supports of the rectum are in any way rigid or inelastic. But we must also not imagine on this account that the supports are indefinite or inadequate. We must in other words look upon the anatomical relations and facts from a new standpoint if we are to interpret their significance with any degree of assurance.

I have merely used the rectal stalks as illustration of the newer conceptions which are presenting themselves to anatomists and to clinicians alike in the study of the human body and I venture to predict that with the spread of these conceptions anatomy will become the study of the living body, it being recognized that the cadaver presents only a gross caricature of the functional conditions represented during life.

—*T. Wingate Todd* (per *J. J. R. M.*).

Spirochetes in Healed Syphilis

"BETWEEN the pathologist and the clinician there is always a certain antagonism of attitude with reference to the curability of any given disease. The clinician is, and naturally must be, more or less optimistic as to the results of therapy. . . . . The pathologist . . . . . becomes pessimistic as to ultimate cure because of his constantly recurring experience of finding evidences of active disease in cases clinically cured."

With this statement Warthin[1] introduces an account of his study of a series of clinically cured cases of syphilis in which he sought the Treponema pallidum. He used the original Levaditi method, applying it in 41 autopsy cases which were examined on the pathologic service of the University of Michigan. These cases were divided into three groups: (1) cases in which there was a known history of syphilis, with treatment regarded as adequate and resulting in a cure; (2) cases in which the syphilitic infection was recognized as still active, treatment being continued; (3) cases in which a syphilitic history could not be obtained or was specifically denied by the patient, the clinical diagnosis not including syphilis, and no antisyphilitic treatment given. In group 1, there were 11 cases; in group 2, 5 cases; and in group 3, 25 cases. In all of these, lesions of active syphilis were found and in them the spirochetes were demonstrated. Active luetic lesions were found in the heart in 36 cases, in the aorta in 32, in the testes in 31, in the liver in 4, in the adrenals in 6, in the spleen in 1, in the pancreas in 6, and in the central nervous system in 5. The order of organic infection according to frequency is aorta, heart, tests, adrenal, pancreas, nervous system, liver and spleen. It happens logically then, that the triad of interstitial myocarditis, aortitis, and orchitis fibrosa may be taken as a pathologic complex indicating the occurrence of a syphilitic infection in the male.

Warthin's material comes almost without exception from the University Hospital, an institution in which the patients represent the average middle class population of the State of Michigan, and the forty-one cases he has studied represent about one-third of the adult cases which were subject to postmortem examination in 1912-1914.

In group 1, there was one positive Wassermann, 5 negative, and in 5 cases a Wassermann was not done. In group 2, there were 4 positive Wassermanns, and in 1 no Wassermann was done. In group 3, a Wassermann was not made in 11 cases, was negative in 10, and positive in 4.

It is true, as Warthin says, that the sociologic importance of this is very great. It places latent syphilis upon a plane of importance nearly, if not equally, that of tuberculosis, as a factor opposed to the health and progress of the race. Latent syphilis, Warthin believes, will be found to be the chief factor in the production of myocardial insufficiency and the cardiovascular renal complex, apparently so rapidly increasing—so rapidly, one may add, that an Association has recently been formed to study it and prevent the increase.

From the therapeutic side the lesson is evident, and from the standpoint of serologic reactions, it may be suspected that a negative reaction means nothing.

—*P. G. W.*

[1]Warthin: Amer. Jour. Med. Sc., 1916 (1153) 508.